those with functional improvement differed significantly from those without change in WOMAC function scores (p<0.001). During BL→Y2, extensor muscle strength decreased by 4.6% in those with worsening knee function (during Y2→Y4), decreased by 7.7% in those with improvement in knee function, and decreased by 4.3% in those without change in knee function (Figure 1). The longitudinal loss in extensor muscle strength during BL→Y2 in those with worsening function during Y2→Y4 did not differ significantly from those without function change (p=0.92), but the decrease in strength during BL→Y2 in those with functional improvement during Y2→Y4 was significantly greater than in those without change in function scores (p<0.05) (Figure 1). The above observations did not differ between men and women (data not shown). There were no differences between changes in flexor muscle strength across the above groups (Figure 1), neither concurrent with the WOMAC function changes nor during the 2 year period preceding them.

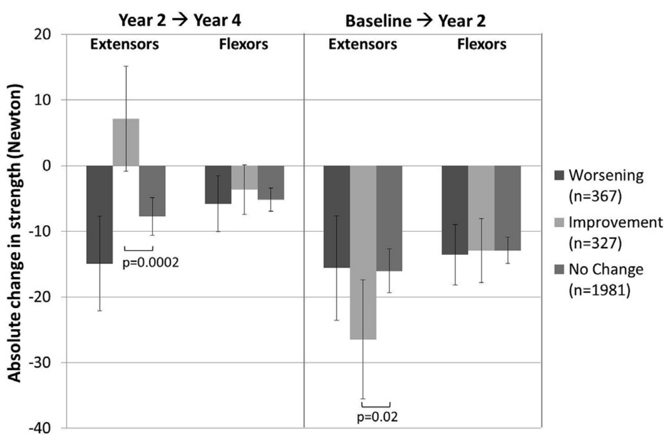

Figure 1. Absolute changes (with 95%CIs) in knee extensor and flexor strength concurrently (Year 2 → Year 4) and prior (Baseline → Year 2) to changes in knee function across stratas.

Conclusions: The findings suggest that there is a concurrent longitudinal association between the change in thigh extensor (but not flexor) muscle strength with that in knee function in KOA. A concurrent reduction in strength was seen in knees functionally worsening, albeit not significantly stronger than in knees without relevant function change, whereas a highly significant increase was seen in those with functional improvement. Surprisingly, knees with improvement in WOMAC function during Y2→Y4 displayed a greater reduction in extensor strength during BL→Y2 than those with worsening function or no change during Y2→Y4. We have no plausible explanation for this. Although participants with relevant improvement in WOMAC function (Y2→Y4) showed some reduction in WOMAC function during BL→Y2 and those with relevant worsening in function (Y2→Y4) showed some improvement in function during BL→Y2, the above relationship with extensor muscle strength change is not readily explained by a “regression-to-the-mean” effect, given that isometric muscle strength measurement and self-assessed WOMAC function scores are separate evaluation tools.

573
RELATIONSHIP BETWEEN PAIN, PHYSICAL PERFORMANCE, KNEE EXTENSION MUSCLE STRENGTH AND OSTEOARTHRITIS SEVERITY IN PATIENTS WITH OSTEOARTHRITIS

S. Taş, G. Coşkun, N. Bek. *Hacettepe Univ., Ankara, Turkey*

Purpose: The aim of this study was to investigate the relationship between pain during rest and activity, physical performance, knee extension isokinetic muscle strength and osteoarthritis severity in patients with osteoarthritis.
Methods: Seventy-six individuals (mean age: 48.06±8.53 years) without orthopaedic and neurologic problem that would effect physical performance or muscle strength accompanying with Level I, II, or III osteoarthritis according to the Kellgren and Lawrence grade on radiography participated in the study. Physical performance was measured with 50m walking test and 12-step stair up and down test. An isokinetic dynamometer Biodex System 3 was employed to assess muscle strength at 2 angular velocities, 90°/s, 120°/s and 180°/s. Visual Analog Scale (VAS) was used to assess pain during rest and following stair test.
Results: Pain in rest was 11.62±20.93 mm while pain following stair test was 32.53±24.14 mm in patients. Knee extension muscle strength was 81.28±31.01 Nm at 90°/s, and 59.14±19.08 Nm at 180°/s angular velocities. Stair up and down duration time was 11.62±20.93s; while walking test duration time was 34.01±4.32s. No relationship were found between the severity of osteoartritis and pain and between extension muscle strength and physical performance (r˂0.20; p˃0.05). There was no relationship between knee extension muscle strength and pain during rest at 90°/s angular velocity (r:-0.106; p:0.657) but there was an inverse moderate correlation with pain levels following stair test (r:-0.514; p:0.001). Similarly, there was no relationship between knee extension muscle strength and pain during rest pain during rest at 180°/s angular velocity (r:-0.046; p:0.848); but there was an inverse moderate correlation with pain levels following stair test (r:-0.407; p:0.043). In addition, there was a moderate correlation between pain levels during rest and activity (r:0.409; p:0.012). Additionally, moderate and strong correlation were found between the quadriceps muscle strength in 90°/s angular velocity and time of ascending and descending the stairs (r:0.624, p<0.001) and time of 50 m gait (r:0.512, p<0.001). Similarly, moderate correlation was found between the quadriceps muscle strength in 120°/s angular velocity and time of ascending and descending the stairs (r:0.501, p<0.001) and time of 50 m gait (r:0.412, p<0.001).
Conclusions: We suggest that it is possible to decrease the pain during activity as a result of increase in M. Quadriceps femoris muscle strength through adding strengthening protocols to rehabilitation program to develop extension moment in varied angular velocities in patients with knee osteoarthritis. In addition, decrease in pain during activity helps patients to feel lower pain levels during rest.

574
INTRARATER RELIABILITY, STANDARD ERROR, MINIMUM DETECTABLE CHANGE, AND RESPONSIVENESS OF CLINICAL PRESSURE PAIN THRESHOLD TESTING IN PATIENTS WITH OSTEOARTHRITIS OF THE KNEE

E. Kaya Mutlu, A. Razak Ozdincler. *Istanbul Univ., Faculty of Hlth.Sci., Div. of Physiotherapy and Rehabilitation, Istanbul, Turkey*

Purpose: Mechanically evoked pain, particularly that used to assess the pressure pain threshold (PPT), is a popular model for inducing acute and chronic pain. Algometry is a useful technique for determining the PPT, and it has been used widely in both clinical and experimental research. PPT is a valid and reliable pain measurement tool in patients with knee OA. However, responsiveness, standard error, and minimum detectable change (MDC) were not evaluated in previous studies.The purpose of this study was to evaluate the intrarater reliability, responsiveness, minimum detectable change (MDC), and standard error of measurement (SEM) of algometry in measuring the PPT in patients who have pain associated with knee osteoarthritis (OA).
Methods: Subjects attended 12 treatment sessions (3 times a week) in the physical therapy clinic and underwent assessment before treatment and after 4 weeks of treatment. PPT, as measured by algometry (Push-Pull Force Gauge®, Fabrication Enterprises, Inc.), was evaluated 3 times at 2-min intervals over 2 clinically relevant sites (mediolateral to the medial femur tubercle and lateral to the medial malleolus) on the same day. The intraclass correlation coefficient (ICC) was used to estimate the intrarater reliability. MDC and SEM were calculated. As a measure of responsiveness, the effect size and standardized response mean (SRM) were calculated for the results at baseline and the end of treatment.
Results: Seventy-three patients (141 knees; mean patient age, 54.5 years; age range, 40-69 years) with OA were included in the study. The intrarater reliability was almost perfect (ICC = 0.93-0.97). The SEM and MDC ranged 0.67-0.65 and 1.55-1.50, respectively. The SRM and effect size were 43.4-29.14 and 0.71-0.69, respectively.
Conclusions: On the basis of the results obtained in the assessments of the measurement properties, the PPT is reliable and responsive, and it can be used in patients with knee OA in clinical practice, especially one time by professional examiner.